



Satellite aerosol retrieval at high spatial resolution.

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The MODIS dark-target aerosol retrieval algorithms were designed nearly two decades ago for the purpose of climate applications. Since launch of Terra in 1999, these two sensors have provided global, quantitative information about column-integrated aerosol properties, including aerosol optical depth (AOD) over dark land and ocean and relative aerosol type parameters (such as Ångstrom exponent) over ocean. This global data product has been provided at a nominal (near nadir) spatial resolution of 10 km, which is generally smaller than the expected variability of aerosol properties. Hence, it is suitable for deriving global statistics of aerosol climatology.

Although designed for climate, the air quality (AQ) community quickly recognized that satellite-derived aerosol products could be used for studying air quality. However, the 10km resolution was not fine enough to resolve smaller scale variability of plumes over urban areas and regions of local scale biomass burning. With the recent delivery of the MODIS Collection 6 (C006) aerosol retrieval algorithm, the MODIS data record will also be produced at 3 km resolution over the entire globe. Although, the logic of the cloud masking, mathematical inversions, and lookup tables is identical to that used for the 10km retrieval, there is a somewhat more conservative method for suitable pixel selection. Preliminary validation of this 3km retrieval, utilizing ground-based AERONET-DRAGON and other datasets, indicate that this new MODIS product can provide new information about the nature of the fine scale spatial variability of aerosol.